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To	Paul Grittner, WDNR-Remediation & Redevelopment David Buser, WDNR-Waste & Materials Management	Page 1 of 6
CC	Trevor Nobile, WDNR- Remediation & Redevelopment Pam Mylotta, WDNR-Remediation & Redevelopment James Walden, WDNR-Remediation & Redevelopment Doug Neumann, City of West Bend Jay Shambeau, City of West Bend	
Subject	Review of New Permanent Monitoring Well Nest Locations - Revised Vapor Intrusion and Expanded Groundwater Investigation Schuster Drive Landfill, City of West Bend, Wisconsin BRRTS# 02-67-584461; SW License #: 0224; FID# 267059320	
From	Leo Linnemanstons, AECOM Tory Schultz, AECOM	
Date	April 30, 2021	

On behalf of the City, AECOM revised our previous Technical Memorandum, dated April 16, 2021, regarding the proposed locations for new permanent monitoring well nests. The revisions are based on feedback we received from the WDNR during our conference call on April 16, 2021 (@3:00pm). The previous Technical Memorandum was prepared following a conference call on with the WDNR on March 31, 2021, to review the proposed locations and reach consensus. The technical memoranda serve to memorialize points of discussion and the information considered for reaching consensus.

As discussed previously, the City is working to complete the vapor intrusion activities that were initiated based on the *Work Plan for Vapor Intrusion and Expanded Groundwater Investigation,* which was prepared and submitted to the WDNR in April 2019. The City and WDNR have worked collaboratively throughout the investigation and response to the discovery of vapor intrusion occurring in several residences within the Villa Park Subdivision located adjacent to the east of the Schuster Drive Landfill. Therefore, the purpose of these meetings was to review and reach consensus for the location and number of permanent monitoring wells with respect to the following two goals:

- (primary) to complete the vapor intrusion investigation by providing locations to monitor the VOC groundwater plume concentrations beneath homes in the Villa Park Neighborhood.
- (secondary) to replace existing monitoring wells in the landfill groundwater monitoring program because of issues with their locations or condition.

In consideration of the feedback from WDNR, we have expanded the number of well locations and focused their construction to monitor for volatile organic compounds (VOCs) in the shallow glacial sand and gravel aquifer. We believe that the proposed monitoring wells are now more appropriately located in alignment with the primary purpose of completing the vapor intrusion investigation. With the hope of reaching a consensus regarding these proposed monitoring well locations, the City is planning for the installation of new monitoring wells by mid-May 2021, and then to collect groundwater samples from newly installed monitoring wells concurrent with the annual groundwater monitoring event scheduled in June.

1.0 BACKGROUND

The Work Plan presented the installation of up to 6 new monitoring wells as two well nests consisting of a water table well and a piezometer screened at the bottom of the sand and gravel aquifer. The well nest locations were contingent on the outcome of the temporary well and vapor intrusion investigations.

In October 2020, AECOM presented to the WDNR the attached Figure 1 – Proposed Monitoring Well Abandonments, which also presented the proposed well nest locations for vapor intrusion investigation. The figure contained a table of the groundwater monitoring program and proposed changes that were being evaluated as part of an overall groundwater plan modification for the Schuster Drive Landfill. The purpose of that submission and ensuing discussion with WDNR was to introduce the City's intentions for the following:

- completing the vapor intrusion investigation with WDNR R&R with installation of these permanent monitoring wells, and
- completing a plan modification with WDNR WMM to formally update the landfill monitoring program.

While this technical memorandum is specifically regarding the installation of the new permanent well nests for the completion of the vapor intrusion investigation, the City continues to prepare a formal Groundwater Plan Modification for updating the entire groundwater monitoring program for the Schuster Dr Landfill, which will include other proposed monitoring well abandonments and replacements. While WDNR may concur with the new well nest locations for the purposes of completing the vapor intrusion investigation, we understand that approval of the other proposed changes will need to follow the established formal WDNR plan modification process.

Groundwater and vapor intrusion investigation information was previously presented in the *Interim Vapor Intrusion Progress Report,* dated March 12, 2020, which provided results through February 28, 2020, and was supplemented with additional periodic updates emailed to the WDNR through 2020 and into 2021. Furthermore, the recently submitted *2018-2019 Biennial Groundwater Monitoring Report*, dated March 24, 2021, provides additional groundwater monitoring data from the ongoing landfill monitoring program.

To support the review of the proposed well nest locations, attached are the following figures:

The following figures highlight results of the Vapor Intrusion Investigation and specifically shows the focus area in the southeast portion of the Villa Park Subdivision:

- Figure 2 – Vapor Intrusion Investigation – Vapor Sampling Status
- Figure 3 – Vapor Intrusion Investigation – Sump Water Sampling Status

The following figures show groundwater flow directions around the landfill and beneath the Villa Park Subdivision based on data from the annual landfill monitoring program:

- Figure 3B – Water Table Map, Shallow Glacial Aquifer (2019)
- Figure 4B – Potentiometric Map, Deep Bedrock Aquifer (2019)

The following figures show a groundwater TCE plume around the landfill and beneath the Villa Park Subdivision based on data from the annual landfill monitoring program and expanded groundwater investigation:

- Figure 7 – TCE Isoconcentration Map, Shallow Glacial Aquifer (2019/2020)
- Figure 17 – TCE Isoconcentration Map, Deep Bedrock Aquifer (2019)

The following figures show geologic cross-sections through the landfill and beneath the Villa Park Subdivision based on available boring logs and interpretation of available data:

- Figure 1A – Proposed Modification to the Groundwater Monitoring Plan (Cross-Section Location Map)
- Figure 2 – Geologic Cross Section A-A'
- Figure 3 – Geologic Cross-section B-B'

The information presented in these figures, with the exception of the geologic cross-sections, was part of previous submittals to the WDNR for their review and comment. Those submittals provided the supporting data and discussion on their development and significance.

2.0 PROPOSED MONITORING WELL LOCATIONS FOR VAPOR INTRUSION MONITORING

The primary purpose of new groundwater monitoring well nest locations are for the completion of the vapor intrusion investigation. Therefore, those monitoring wells are proposed at locations to provide long-term monitoring of the groundwater conditions in close proximity to the foundations of buildings in the Villa Park Subdivision. As mentioned above, the Work Plan presented the installation of up to 6 new monitoring wells as two well nests consisting of a water table well and a piezometer screened at the bottom of the sand and gravel aquifer. Based on the outcome of the temporary well and vapor intrusion investigations, the previous technical memorandum proposed four paired monitoring well nests are proposed for installation to supplement the groundwater monitoring program.

Based on the original proposal, each of the nested well pairs was to include one well screened across the water table and a second well deeper that is completed at the base of the shallow glacial sand and gravel aquifer (and labeled as piezometers "PZ's"). Water table wells were to provide groundwater VOC concentrations and provide data on plume changes overtime. Piezometer wells were to provide information on vertical gradients and also indicate if the VOC plume was migrating at a deeper depth in the shallow glacial sand and gravel aquifer.

However, upon consideration of the feedback received from the WDNR, we have refocused the placement and construction of the monitoring wells. To provide more coverage of the shallow glacial sand and gravel aquifer, three monitoring well locations were added to the original four monitoring well locations. The previously planned piezometers are no longer proposed because monitoring of the bottom of the sand and gravel aquifer was unnecessary for vapor intrusion risk and were considered redundant in the overall landfill monitoring program.

Therefore, seven water table monitoring wells (MW-16 to MW-23) are proposed to be installed within the public right-of-way areas within and near the Villa Park neighborhood located to the northeast, east, and southeast of the landfill. In general, these locations will help confirm the site conceptual model and provide consistent monitoring coverage for VOCs across the subdivision where homes are closest to the water table, whereas the piezometers in deep glacial zones or into

bedrock are not needed for the purpose of determining vapor intrusion risk to the Villa Park Subdivision and neighboring West Bend Highlands Subdivision.

The rationale for each of the locations is as follows:

MW-16/~~PZ-16B~~ (northeast): monitor the northeast portion of the Villa Park Subdivision and historical northeast groundwater VOC plume. Vapor intrusion investigation results places this location outside the focus area where vapor intrusion was observed and remedies undertaken. Vapor intrusion was not observed occurring in this portion of the subdivision, and sump water samples did not indicate the presence of VOCs in foundation water. Given the historical presence of the VOC plume (including TCE) at the water table, groundwater monitoring near homes at the lowest elevation (closest to the water table) was desired.

MW-18/~~PZ-18B~~ and MW-21 (east): monitor the east portion of the Villa Park Subdivision and historical area where the groundwater VOC plume has not been observed. Vapor intrusion investigation results place these locations outside the focus area. Vapor intrusion was not observed occurring in this portion of the subdivision, and sump water samples did not indicate the presence of VOCs in foundation water. Furthermore, temporary well data also did not indicate the presence of VOCs at the water table. However, these locations will help confirm the site conceptual model and provide consistent monitoring coverage for VOCs across the subdivision where homes are closest to the water table.

MW-19/~~PZ-19B~~ and MW-22 (southeast): monitor the southeast portion of the Villa Park Subdivision and where the groundwater VOC plume was found to be present at the water table. Vapor intrusion investigation results place these locations inside the focus area where vapor intrusion was observed and remedies undertaken. The MW-19 location is in an area where vapor intrusion was observed, and sump water and temporary well data indicated the presence of VOCs. The MW-22 location is in an area where vapor intrusion was not observed, but sump water and temporary well data indicated the presence of VOCs.

MW-20/~~PZ-20B~~ (southeast): monitor the southeast portion of the Villa Park Subdivision and where the groundwater VOC plume was found to be present at the water table. Vapor intrusion investigation results places this location inside the focus area where vapor intrusion was observed and remedies undertaken. The MW-20 location is immediately upgradient of the areas where vapor intrusion was observed and sump water indicated the presence of VOCs. Because of the greater depth to the water table from the rapidly increasing ground elevation in the area, temporary well installation failed. Although the location is in the focus area, the homes immediately around this location were observed to not have vapor intrusion. Therefore, this well will provide information on the presence of VOCs at the water table and the stratigraphic separation between home foundations and the water table.

MW-23 (east): monitor the far east extent of the groundwater VOC plume adjacent to the West Bend Highlands Subdivision. Groundwater monitoring results from private well PW-20 indicates the presence of the groundwater VOC plume (including TCE). Well construction information is not available for the private well, but well data indicates that it is likely a bedrock well. Therefore, this well will provide information on the presence of VOCs at the water table and the stratigraphic separation between home foundation and the water table.

An additional monitoring well (MW-17) will also be installed as a replacement for former monitoring well MW-11. Monitoring well MW-11 was abandoned on June 19, 2018 because the PVC casing within the well was bent and impeded equipment from being lowered downhole for groundwater

sampling. New monitoring MW-17 will be offset approximately 120 feet east of the former MW-11 location, so the well location is closer to the landfill access road.

Thus, a total of eight monitoring wells will be installed. The water table monitoring wells will be constructed with 2-inch diameter, Schedule 40 PVC screens and riser pipes except for replacement well MW-17. Because MW-17 will be greater than 100ft in total depth, the well will be constructed of 2.5-nch diameter Schedule 80 PVC screen and riser. All monitoring wells will be completed in accordance with Chapter NR141, Wisconsin Administrative Code (WAC).

3.0 FUTURE PLAN MODIFICATION CONSIDERATIONS

The secondary purpose of the new well nest locations are to add or replace monitoring well locations in the existing groundwater monitoring program. These proposed changes will be discussed in detail in the forthcoming Plan Modification to provide specific justifications and the supporting information. In the previous Technical Memorandum, we provided the following summary regarding how each of the new well nest locations were anticipated to contribute to the proposed monitoring changes:

MW-16/PZ-16B (northeast): replaces C1, C2 (nest), TW15, TW16, and P15 monitoring shallow groundwater and deeper bedrock aquifer northeast of landfill.

MW-18/PZ-18B (east): partial replacement for the D-well nest, consisting of D1 (water table well), D2 (clay till piezometer), and D3 (bedrock piezometer).

MW-19/PZ-19B (southeast): addition to provide monitoring of the shallow groundwater in southeast focus area.

MW-20/PZ-20B (southeast): partial replacement for the E-well nest, consisting of E1 (water table well), E2 (clay till piezometer), and E3 (bedrock piezometer).

However, because we have refocused on monitoring the water table and no longer are adding piezometers, the proposed changes included in the Plan Modification will also be affected. We anticipate that the new MW-16 water table well will still facilitate that proposed abandonment of the nearby water table wells C-1, TW-15, TW-16, and P15. However, we now expect that the D-series and E-series well nests may need to be retained in the landfill monitoring program to continue monitoring the water table and bedrock aquifers, although the intermediate piezometers in both nests may still be abandoned.

As additions and replacements, the new monitoring wells will be positioned in the Villa Park Subdivision for their primary purpose of monitoring the shallow glacial sand and gravel aquifer in the area where building foundations are most likely to be affected by vapor intrusion from the groundwater VOC plume. The proposed plan modification will provide further justifications for abandoning the monitoring wells that are being replaced; however, this memorandum is not seeking the approval for those changes to the landfill groundwater monitoring plan.

6.0 CONCLUSION/RECOMMENDATIONS

We trust this revised Technical Memorandum provides a sufficient level of detail for the installation of the proposed monitoring wells to complete the vapor intrusion investigation in the Villa Park Neighborhood. Therefore, our goal for installing these monitoring wells is to satisfy their primary purpose of monitoring the groundwater VOC plume in the shallow glacial sand and gravel aquifer

beneath the Villa Park Subdivision related to vapor intrusion and then to improve the efficiency of the overall groundwater monitoring program by allowing for the reduction of unnecessary or redundant wells.

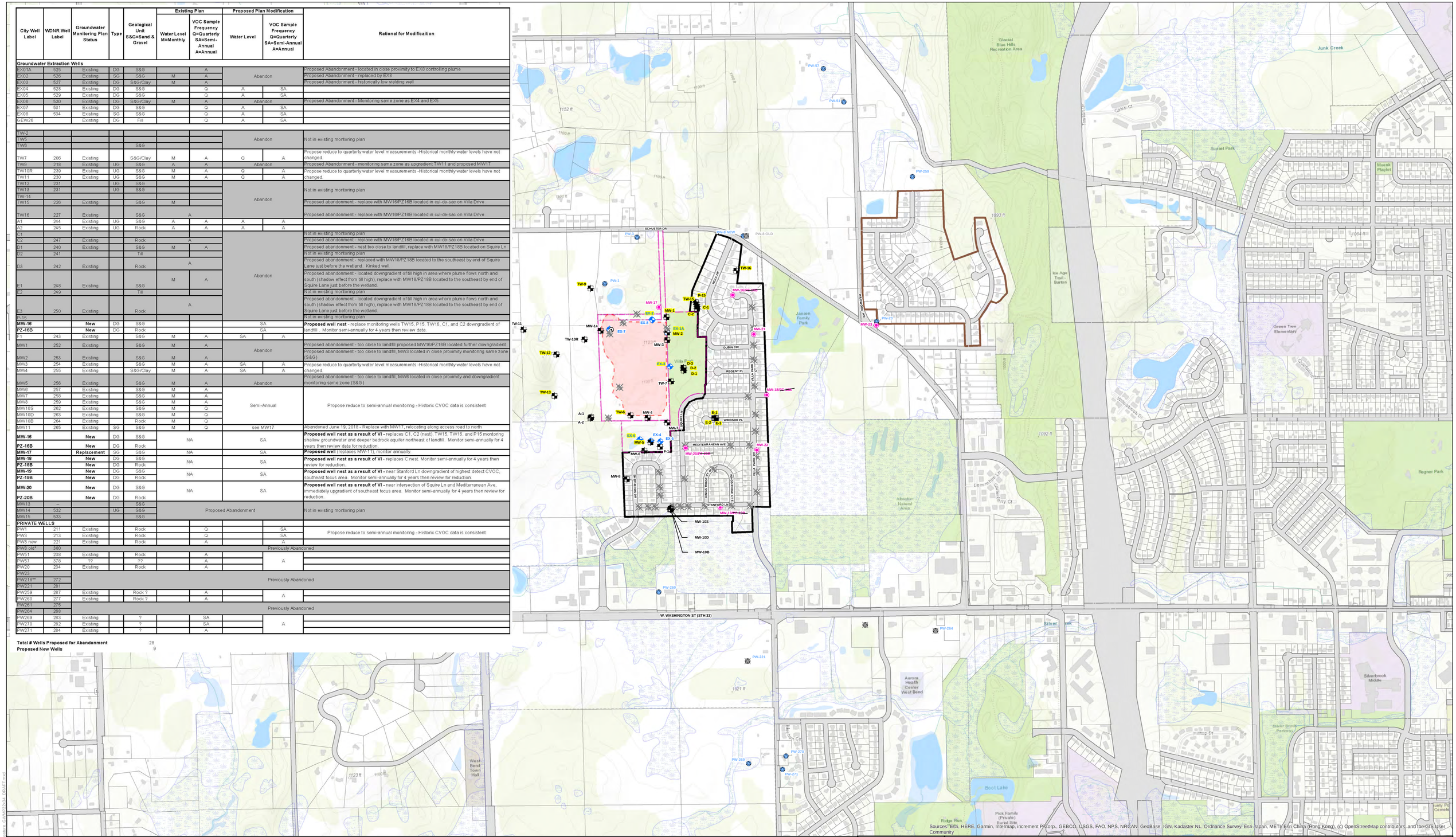
We appreciate the feedback and collaboration with the WDNR to develop this refocused approach for the placement of the permanent monitoring wells and completing the vapor intrusion investigation. Upon WDNR's review of this memorandum, we will schedule a conference call to discuss concurrence or further refinement on the proposed locations.

Attachments:

- Figure 1 – Proposed Monitoring Well Abandonments
- Figure 2 – Vapor Intrusion Investigation – Vapor Sampling Status
- Figure 3 – Vapor Intrusion Investigation – Sump Water Sampling Status
- Figure 3B – Water Table Map, Shallow Glacial Aquifer (2019)
- Figure 4B – Potentiometric Map, Deep Bedrock Aquifer (2019)
- Figure 7 – TCE Isoconcentration Map, Shallow Glacial Aquifer (2019/2020)
- Figure 17 – TCE Isoconcentration Map, Deep Bedrock Aquifer (2019)
- Figure 1A – Proposed Modification to the Groundwater Monitoring Plan (Cross-Section Location Map)
- Figure 2 – Geologic Cross Section A-A'
- Figure 3 – Geologic Cross-section B-B'

City Well Label	WDNR Well Label	Groundwater Monitoring Plan Status	Type	Geological Unit S&G=Sand & Gravel	Existing Plan		Proposed Plan Modification		Rational for Modificaition
					Water Level M=Monthly	VOC Sample Frequency Q=Quarterly SA=Semi-Annual A=Annual	Water Level	VOC Sample Frequency Q=Quarterly SA=Semi-Annual A=Annual	
Groundwater Extraction Wells									
EX01A	525	Existing	DG	S&G		A	Abandon		Proposed Abandonment - located in close proximity to EX8 controlling plume
EX02	526	Existing	SG	S&G	M	A			Proposed Abandonment - replaced by EX8
EX03	527	Existing	DG	S&G/Clay	M	A			Proposed Abandonment - historically low yielding well
EX04	528	Existing	DG	S&G		Q	A	SA	
EX05	529	Existing	DG	S&G		Q	A	SA	
EX06	530	Existing	DG	S&G/Clay	M	A	Abandon		Proposed Abandonment - Monitoring same zone as EX4 and EX5
EX07	531	Existing	DG	S&G		Q	A	SA	
EX08	534	Existing	SG	S&G		Q	A	SA	
GEW26		Existing	DG	Fill		Q	A	SA	
TW-2							Abandon		Not in existing montoring plan
TW5									
TW6				S&G					
TW7	206	Existing		S&G/Clay	M	A	Q	A	Propose reduce to quarterly water level measurements -Historical monthly water levels have not changed.
TW9	218	Existing	UG	S&G	A	A	Abandon		Proposed Abandonment - monitoring same zone as upgradient TW11 and proposed MW17
TW10R	239	Existing	UG	S&G	M	A	Q	A	Propose reduce to quarterly water level measurements -Historical monthly water levels have not changed.
TW11	230	Existing	UG	S&G	M	A	Q	A	
TW12	231		UG	S&G			Abandon		Not in existing montoring plan
TW13	231		UG	S&G					
TW14									
TW15	226	Existing		S&G	M				Proposed abandonment - replace with MW16/PZ16B located in cul-de-sac on Villa Drive.
TW16	227	Existing		S&G	A				Proposed abandonment - replace with MW16/PZ16B located in cul-de-sac on Villa Drive.
A1	244	Existing	UG	S&G	A	A	A	A	
A2	245	Existing	UG	Rock	A	A	A	A	
C1							Abandon		Not in existing montoring plan
C2	247	Existing		Rock	A				Proposed abandonment - replace with MW16/PZ16B located in cul-de-sac on Villa Drive.
D1	240	Existing		S&G	M	A			Proposed abandonment - nest too close to landfill, replace with MW18/PZ18B located on Squire Ln
D2	241			Till					Not in existing montoring plan
D3	242	Existing		Rock	A				Proposed abandonment - replaced with MW18/PZ18B located to the southeast by end of Squire Lane just before the wetland. Kinked well.
E1	248	Existing		S&G	M	A			Proposed abandonment - located downgradient of till high in area where plume flows north and south (shadow effect from till high), replace with MW18/PZ18B located to the southeast by end of Squire Lane just before the wetland.
E2	249			Till					Not in existing montoring plan
E3	250	Existing		Rock	A				Proposed abandonment - located downgradient of till high in area where plume flows north and south (shadow effect from till high), replace with MW18/PZ18B located to the southeast by end of Squire Lane just before the wetland.
P-15									Not in existing montoring plan
MW-16		**New**	DG	S&G			SA		**Proposed well nest** - replace monitoring wells TW15, P15, TW16, C1, and C2 downgradient of landfill. Monitor semi-annually for 4 years then review data.
PZ-16B		**New**	DG	Rock			SA		
P1	243	Existing		S&G	M	A	SA	A	
MW1	252	Existing		S&G	M	A	Abandon		Proposed abandonment - too close to landfill proposed MW16/PZ16B located further downgradient
MW2	253	Existing		S&G	M	A			Proposed abandonment - too close to landfill, MW3 located in close proximity monitoring same zone (S&G)
MW3	254	Existing		S&G	M	A	SA	A	Propose reduce to quarterly water level measurements -Historical monthly water levels have not changed.
MW4	255	Existing		S&G/Clay	M	A	SA	A	
MW5	256	Existing		S&G	M	A	Abandon		Proposed abandonment - too close to landfill, MW6 located in close proximity and downgradient monitoring same zone (S&G)
MW6	257	Existing		S&G	M	A			
MW7	258	Existing		S&G	M	A			
MW8	259	Existing		S&G	M	A			
MW10S	262	Existing		S&G	M	Q	Semi-Annual		Propose reduce to semi-annual monitoring - Historic CVOC data is consistent
MW10D	263	Existing		S&G	M	Q			
MW10B	264	Existing		Rock	M	Q			
MW11	265	Existing	SG	S&G	M	Q	see MW17		Abandoned June 19, 2018 - Replace with MW17, relocating along access road to north
MW-16		**New**	DG	S&G	NA		SA		**Proposed well nest as a result of VI -** replaces C1, C2 (nest), TW15, TW16, and P15 monitoring shallow groundwater and deeper bedrock aquifer northeast of landfill. Monitor semi-annually for 4 years then review data for reduction.
PZ-16B		**New**	DG	Rock					
MW-17		**Replacement**	SG	S&G	NA		SA		**Proposed well** (replaces MW-11), monitor annually.
MW-18		**New**	DG	S&G	NA		SA		**Proposed well nest as a result of VI -** replaces C nest. Monitor semi-annually for 4 years then review for reduction.
PZ-18B		**New**	DG	Rock					
MW-19		**New**	DG	S&G	NA		SA		**Proposed well nest as a result of VI -** near Stanford Ln downgradient of highest detect CVOC, southeast focus area. Monitor semi-annually for 4 years then review for reduction.
PZ-19B		**New**	DG	Rock					
MW-20		**New**	DG	S&G	NA		SA		**Proposed well nest as a result of VI -** near intersection of Squire Ln and Mediterranean Ave, immediately upgradient of southeast focus area. Monitor semi-annually for 4 years then review for reduction.
PZ-20B		**New**	DG	Rock					
MW13	–			S&G	Proposed Abandonment				Not in existing montoring plan
MW14	532		UG	S&G					
MW15	533			S&G					
PRIVATE WELLS									
PW1	211	Existing		Rock		Q		SA	Propose reduce to semi-annual monitoring - Historic CVOC data is consistent
PW3	213	Existing		Rock		Q		SA	
PW8 new	221	Existing		Rock		A		A	
PW8 old*	380	Previously Abandoned							
PW51	238	Existing		Rock		A		A	
PW57	378	??		??		A			
PW20	234	Existing		Rock		A			
PW25		Previously Abandoned							
PW218**	272								
PW221	281								
PW259	287	Existing		Rock ?		A		A	
PW260	277	Existing		Rock ?		A			
PW261	275	Previously Abandoned							
PW264	268								
PW269	283	Existing		?		SA		A	
PW270	282	Existing		?		SA			
PW271	284	Existing		?		A			

Total # Wells Proposed for Abandonment 28
Proposed New Wells 9



Legend

- Proposed Monitoring Well
- Extraction Well/Boring Location
- Monitoring Well/Boring Location
- Private Well Location
- Abandoned Private Well Location
- Abandoned Temporary Well/Boring Location
- Other Well Types
- Approximate Limits of Waste
- Landfill Property Boundary
- Villa Park Subdivisions
- Jansen Subdivision
- Water Body
- Wetland
- Parcel

NOTE:
Approximate well locations were added from historical maps for abandoned wells: TW-2, MW-11, MW-13, MW15 and PW218.
Approximate locations were added from historical maps for the existing wells: EX-6, C-1 and P-15.
The following locations were not added to the map: TW-14, PW-23, PW-261 and TW-14.

0 300 600 1,200 Feet

AECOM
Milwaukee Office
1555 River Center Dr
Milwaukee WI

PROPOSED MONITORING WELL LOCATIONS

Groundwater Monitoring Plan Proposal, Schuster Drive Landfill, SW License # 0224
3995 Schuster Drive
West Bend, WI

Project No. 60485031
Date: April 2021

FIGURE 1

C:\Data\Projects\WestBend\Landfill\mxd\Fig01_SiteFeature_GWMP2x34_DRAFT.mxd

SCHUSTER DR

REUTER LA

WOLF DR

PAINET VILLA

WILDWOOD RD

DUBIN CIR

REGENT PL

WINDSOR PL

SQUIRE LN

MEDITERRANEAN AVE

KINGSLEY WAY

SHERWOOD DR

VILLA PARK DR

STANFORD LN

MW-16/PZ-16B

MW-17

MW-18/PZ-18B

MW-19/PZ-19B

MW-20/PZ-20B

MW-21

MW-22

MW-23

Legend

123 • Field Identification Designation (FID)

Approximate Limits of Waste

Southeast Focus Area

Vapor Sampling Status

Sampled Target Analyte List

Department of Health Services (DHS)

Non-Responsive or Denied Access To Property

Vacant Lot

Existing Radon System

SSDS Installed

Sanitary Gravity Main

INDOOR AIR AND SUB-SLAB AIR

1 - Indoor Air Results

(VAL Comparison)
Green = Non Detect to 75% of VAL
Yellow = 75% of VAL to VAL
Red = > VAL
White = No Results

2 - Sub-Slab or Existing Radon System Air Results
(VRSL Comparison)
Green = Non Detect to 75% of VRSL
Yellow = 75% of VRSL to VRSL
Red = > VRSL
White = No Results

The most recent data by date is shown by the symbol color.

NOTES:
1. WDNR Approved Target Analyte List = Tetrachloroethene (PCE), Trichloroethene (TCE), 1,1-Dichloroethene (DCE), Vinyl Chloride (VC)
2. VAL = Vapor Action Level. Based on Wisconsin Vapor Quick Look-Up Table, Based on November 2017 U.S. Environmental Protection Agency (EPA).
3. VRSL = Vapor Risk Screening Level. Based on Wisconsin Vapor Quick Look-Up Table, Based on November 2017 U.S.
4. EPA Regional Screening Levels.
5. SSDS = Sub-Slab Depressurization System
6. Existing Radon System = Influent samples collected upstream of fan.
7. Sampled = Indoor Air, Sub-Slab Vapor, and/or existing radon system influent for Target Analyte List
8. Parcels with multiple dwellings on the property are grouped by each building.

WDNR License No. 0224
WDNR FID No. 267059320
BRRTS Activity # 02-67-584461

N W E S

1 inch = 250 feet

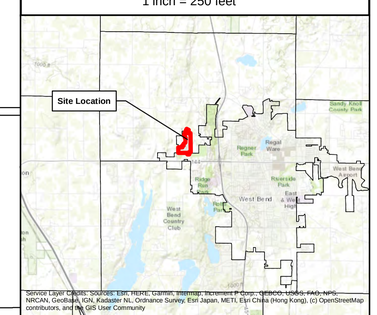


FIGURE 2
VAPOR INTRUSION INVESTIGATION SAMPLING STATUS
WEST BEND LANDFILL

April 2021 60485031

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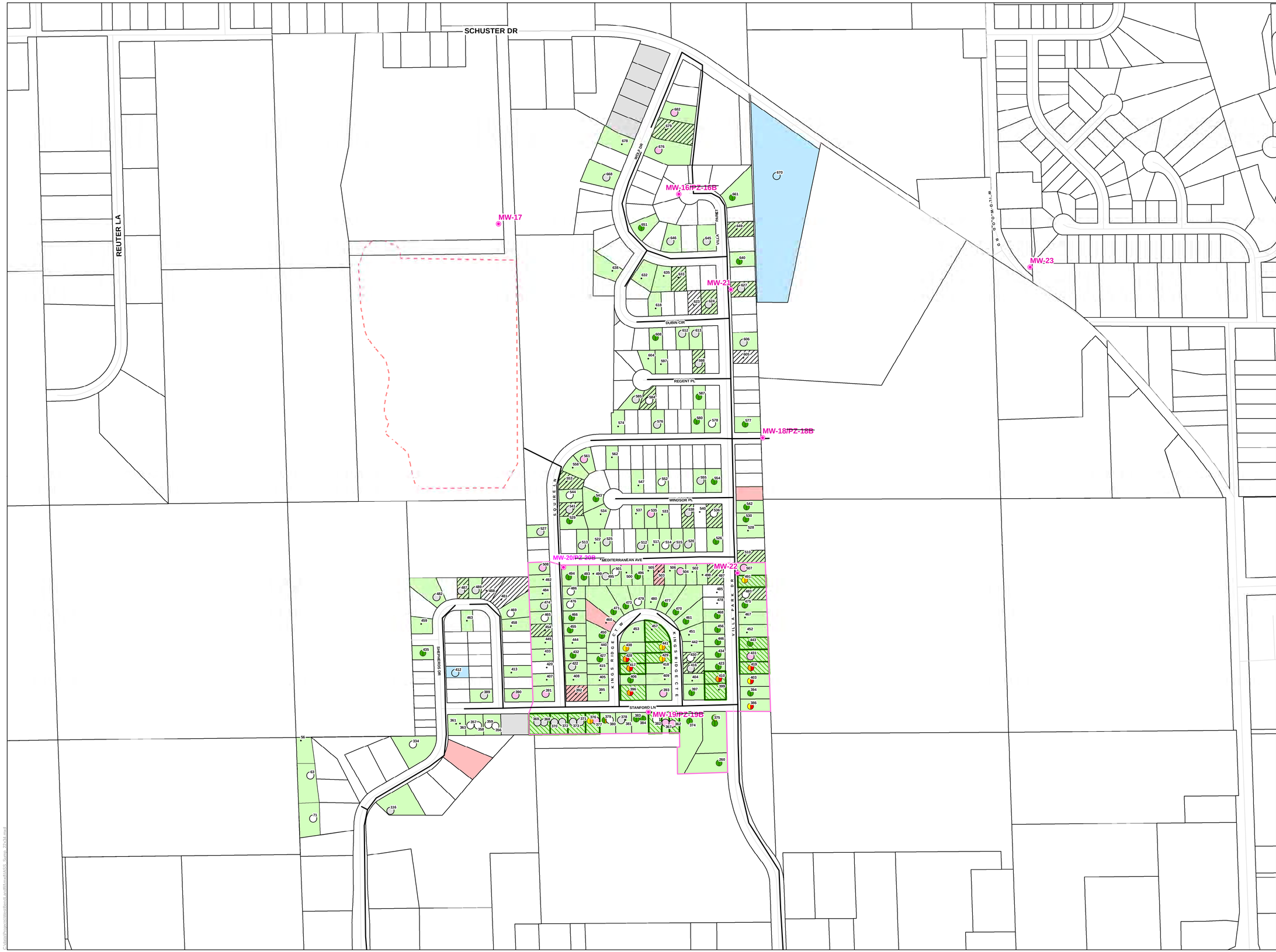


Legend

123 • Field Identification Designation (FID)

Approximate Limits of Waste

Southeast Focus Area

Vapor Sampling Status

Sampled Target Analyte List

Department of Health Services (DHS)

Non-Responsive or Denied Access To Property

Vacant Lot

Existing Radon System

SSDS Installed

Sanitary Gravity Main

SUMP WATER RESULTS

1 | 2

1 - Cis-1,2-DCE Sump Water Results
(ES=70 ug/L and PAL=7 ug/L Comparison)
Green = Non Detect
Yellow = < PAL
Orange = > PAL, < ES
Red = > ES

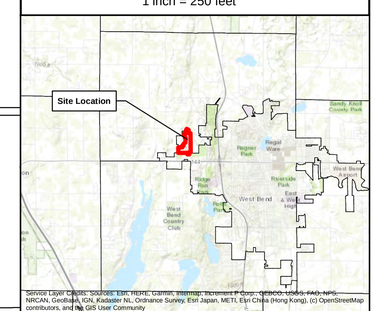
2 - TCE Sump Water Results
(ES=5 ug/L and PAL=0.5 ug/L Comparison)
Green = Non Detect
Yellow = < PAL
Orange = > PAL, < ES
Red = > ES

NOTES:
1. Sump Water Was Analyzed for 42 Volitile Organic Compounds (VOCs), Which Included the WDNR Approved Target Analyte List: Tetrachloroethene (PCE), Trichloroethene (TCE), 1,1-Dichloroethene (DCE), Vinyl Chloride (VC) and Compared To the NR 140 ES and PAL.
2. Chemical Abbreviations:
   Trichloroethene (TCE)
   Cis-1,2-Dichloroethene (Cis-1,2 DCE)
3. PAL = Wisconsin Administrative Code, Chapter NR 140 Preventive Action Limit, February 2017.
4. ES = Wisconsin Administrative Code, Chapter NR 140 Enforcement Standard, February 2017.
5. SW = Sump Water
6. Parcels with multiple dwellings on the property are grouped by each building.
7. Only Cis1,2-DCE and TCE are shown. Other analyte detections are not represented in the sump water results. See Sump Water Table.

WDNR License No. 0224
WDNR FID No. 267059320
BRRTS Activity # 02-67-584461

N
W E
S

1 inch = 250 feet



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

FIGURE 3
VAPOR INTRUSION INVESTIGATION SAMPLING STATUS
WEST BEND LANDFILL

April 2021 60485031

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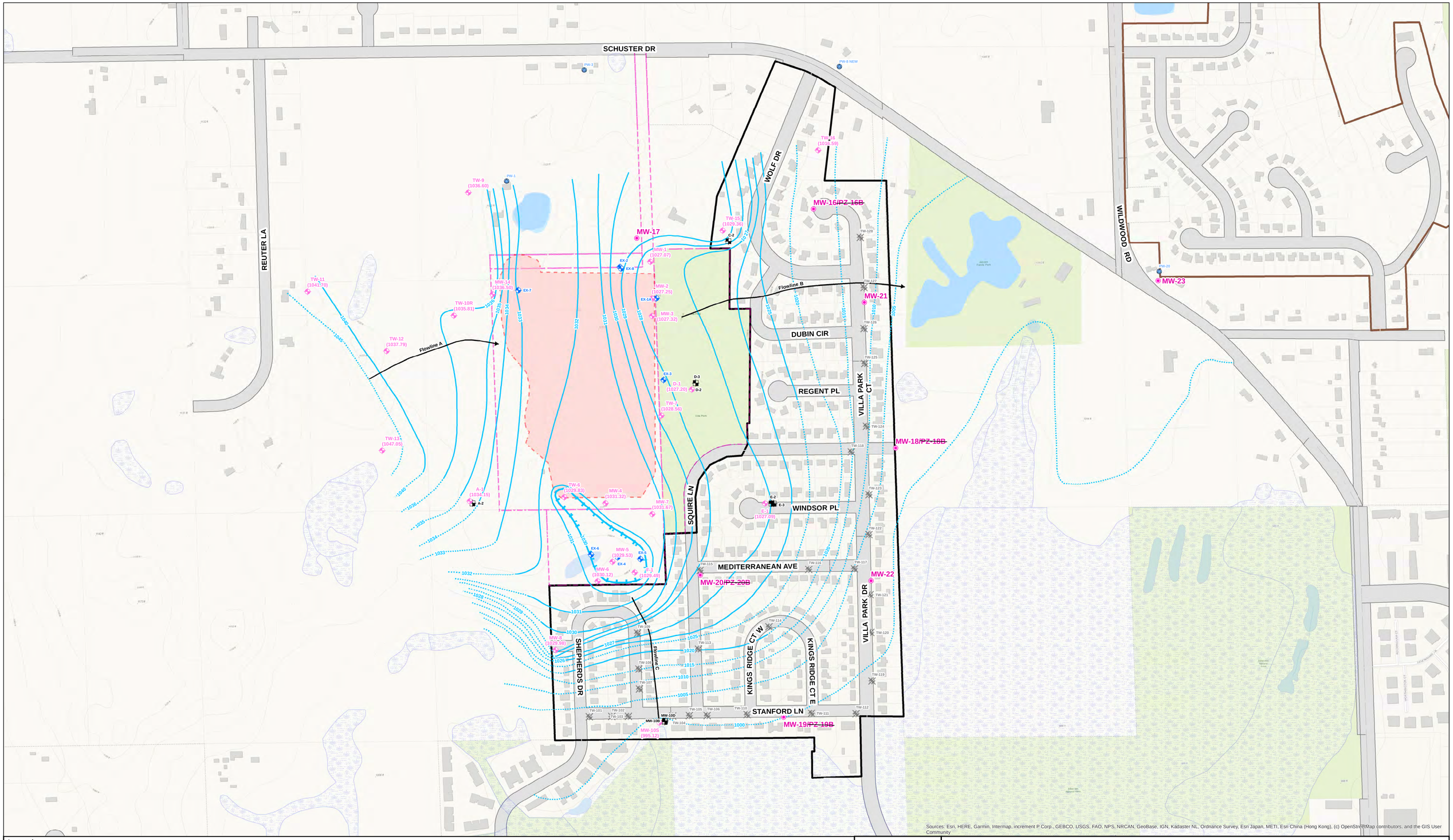

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Legend

- Proposed Monitoring Well to be Added to GWMP
- Monitoring Well With Water Level Measured
- Extraction Well/Boring Location
- Monitoring Well/Boring Location
- Private Well Location
- Abandoned Temporary Well/Boring Location
- Groundwater Flowline
- Groundwater Elevation Inferred Contour (Feet MSL)
- Groundwater Elevation Inward Contour (Feet MSL)
- Groundwater Elevation Contour (Feet MSL)
- Approximate Limits of Waste
- Landfill Property Boundary
- Villa Park Subdivisions
- Jansen Subdivision
- Water Body
- Wetland

Note:
1. The following wells are shown:
   -Monitoring wells screened within the Glacial Aquifer.
   -Private wells with unknown screen information: PW-51, PW-57, PW-221, PW-259, PW-260, PW-264, PW-269, PW-270, and PW-271.
2. Groundwater elevations were taken on June 4, 5, and 6, 2019.
3. MSL = Mean See Level

N

0 125 250 500 Feet

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Milwaukee WI

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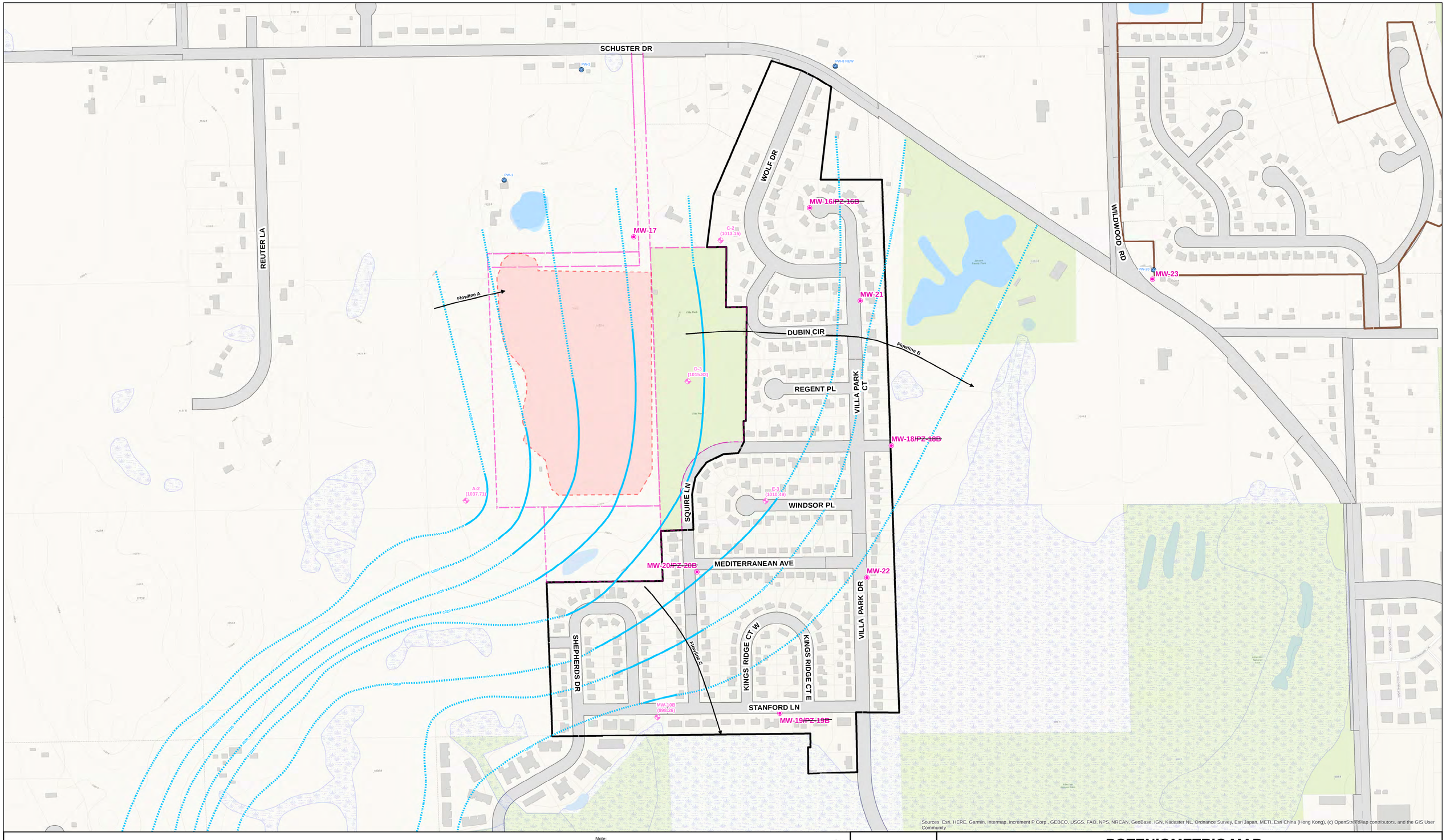
WATER TABLE MAP, SHALLOW GLACIAL AQUIFER (2019)

Schuster Drive Landfill, SW License # 0224
3995 Schuster Drive
West Bend, WI

Project No.
60135471

Date:
April 2021

FIGURE 4



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Legend

- Proposed Monitoring Well to be Added to GWMP
- Monitoring Well With Water Level Measured
- Private Well Location
- Groundwater Flowline
- Approximate Limits of Waste
- Landfill Property Boundary
- Villa Park Subdivisions
- Jansen Subdivision
- Water Body
- Wetland
- Groundwater Elevation Contours (Feet MSL)
- Groundwater Elevation Inferred Contour (Feet MSL)

Note:
1. The following wells are shown:
   -Monitoring wells screened within the Bedrock Aquifer.
   -Private wells with unknown screen information: PW-51, PW-57, PW-221, PW-259, PW-260, PW-264, PW-269, PW-270, and PW-271.
2. Groundwater elevations were taken on June 4, 5, and 6, 2019.
3. MSL = Mean See Level

N

0 125 250 500 Feet

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1555 River Center Dr
Milwaukee WI

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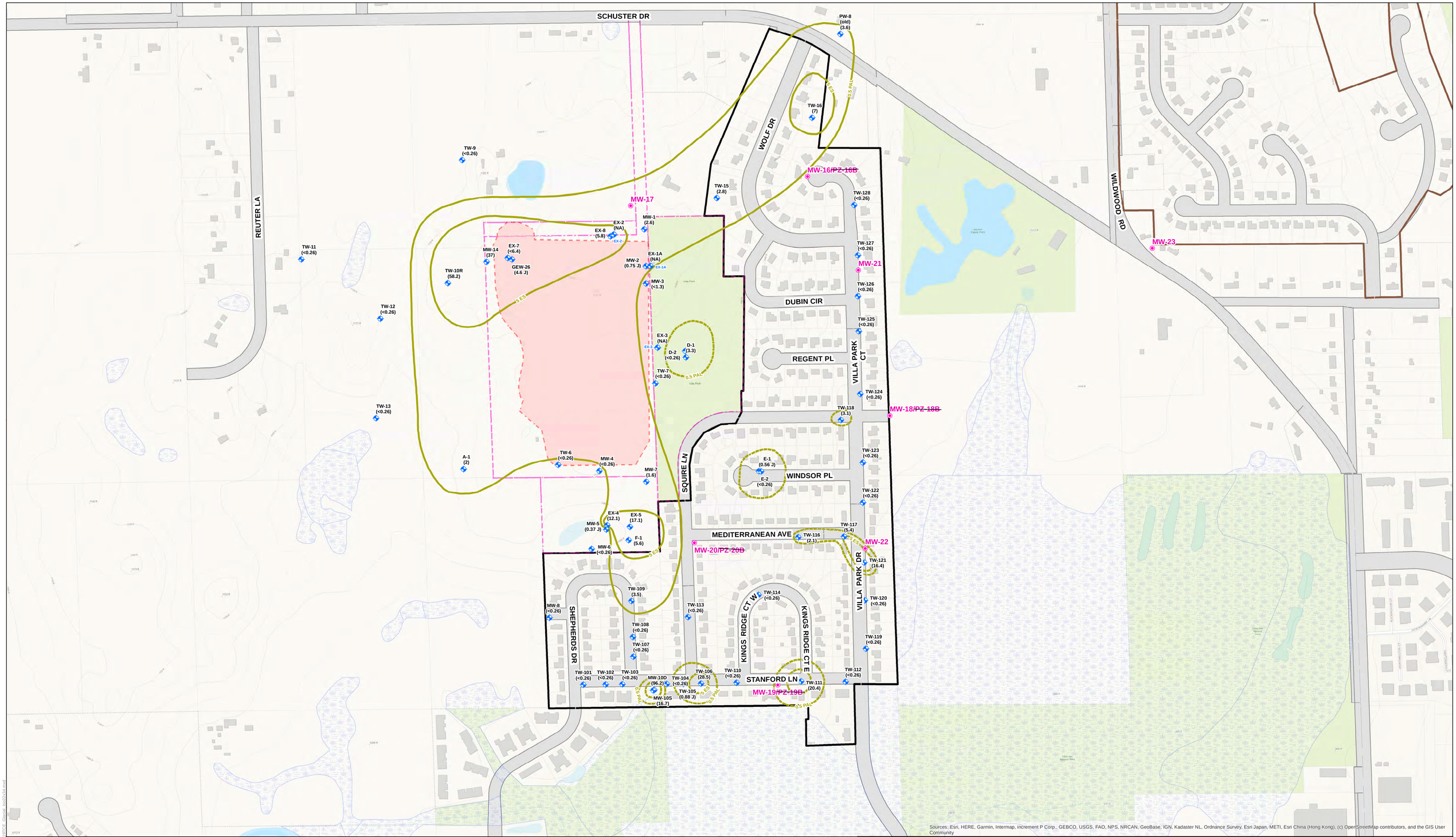
POTENIOMETRIC MAP, DEEP BEDROCK AQUIFER (2019)

Schuster Drive Landfill, SW License # 0224
3995 Schuster Drive
West Bend, WI

Project No.
60135471

Date:
April 2021

FIGURE 4B



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Legend

- Proposed Monitoring Well to be Added to GWMP
- TW2020results
- Well with TCE concentration in ug/L
- Extraction Well/Boring Location
- Approximate Limits of Waste
- Landfill Property Boundary
- Villa Park Subdivisions
- Jansen Subdivision
- Water Body
- Wetland

Note:
1. The following wells are shown:
   -Monitoring wells screened within the Glacial Aquifer.
   -Private wells with unknown screen information are shown on both, glacial and bedrock aquifer isoconcentration maps: PW-51, PW-57, PW-221, PW-259, PW-260, PW-264, PW-269, PW-270, and PW-271.
2. Analyte data was obtained from samples collected March, June and July 2019 and July 2020.

Trichloroethylene (TCE) concentration
Preventive Action Limit (PAL) = 0.5 ug/L
Enforcement Standard (ES) = 5.0 ug/L

N

0 125 250 500 Feet

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TCE ISOCONCENTRATION MAP, SHALLOW GLACIAL AQUIFER (2019)

Schuster Drive Landfill, SW License # 0224
3995 Schuster Drive
West Bend, WI

Project No.
60485031

Date:
April 2021

FIGURE 7

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TCE ISOCONCENTRATION MAP, DEEP BEDROCK AQUIFER (2019)

Schuster Drive Landfill, SW License # 0224
3995 Schuster Drive
West Bend, WI

Legend

- Proposed Monitoring Well to be Added to GWMP
- Well with TCE concentration in ug/L
- Approximate Limits of Waste
- Landfill Property Boundary
- Villa Park Subdivisions
- Jansen Subdivision
- Water Body
- Wetland

Note:
1. The following wells are shown:
   -Monitoring wells screened within the Glacial Aquifer.
   -Private wells with unknown screen information are shown on both, glacial and bedrock aquifer isoconcentration maps: PW-51, PW-57, PW-221, PW-259, PW-260, PW-264, PW-269, PW-270, and PW-271.
2. Analyte data was obtained from samples collected March, June and July 2019. PW-08 analyte data obtained on 6/9/2015.

Trichloroethylene (TCE) concentration
Preventive Action Limit (PAL) = 0.5 ug/L
Enforcement Standard (ES) = 5.0 ug/L

0 150 300 600 Feet

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Milwaukee WI

Project No.
60135471

Date:
April 2021

FIGURE 17

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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Legend

- GG
- GR
- GW
- GY
- RG
- YG
- Proposed Monitoring Well to be Added to GWMP

NOTE: Highlighted Monitoring or Extraction Wells are proposed to be abandoned

- Extraction Well/Boring Location
- Monitoring Well/Boring Location
- Private Well Location
- Abandoned Private Well Location
- Abandoned Temporary Well/Boring Location
- Gas Extraction Well/Boring Location
- TCE
- TCE inferred
- Approximate Limits of Waste
- Landfill Property Boundary
- Villa Park Subdivisions
- Jansen Subdivision
- Water Body
- Wetland
- Parcel

NOTE:
Approximate well locations were added from historical maps for abandoned wells: TW-2, TW-5, MW-11, TW-14, MW-13, MW15 and PW218.
Approximate locations were added from historical maps for the existing wells: EX-6, C-1 and P-15.
The following locations were not added to the map: PW-23 and PW-261.
GWMP = Groundwater Monitoring Plan

0 150 300 600 Feet

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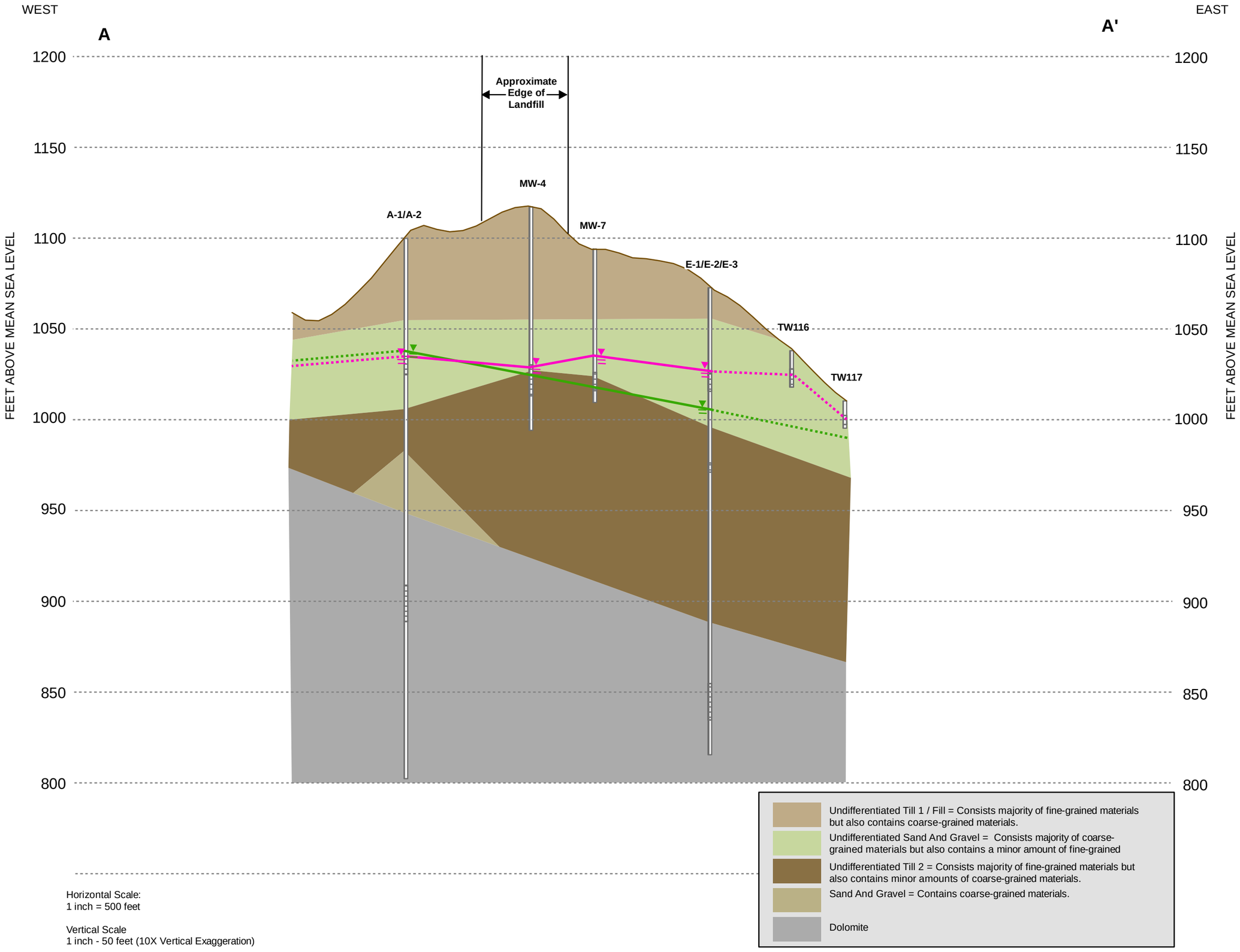
PROPOSED MODIFICATIONS TO THE GROUNDWATER MONITORING PLAN WITH TCE AND INDOOR AIR AND SUB-SLAB OVERLAYS

Schuster Drive Landfill, SW License # 0224
3995 Schuster Drive
West Bend, WI

Project No. 60485031

Date: April 2021

FIGURE 1A



Horizontal Scale:
1 inch = 500 feet

Vertical Scale
1 inch - 50 feet (10X Vertical Exaggeration)

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FIGURE 2
CROSS SECTION A-A'

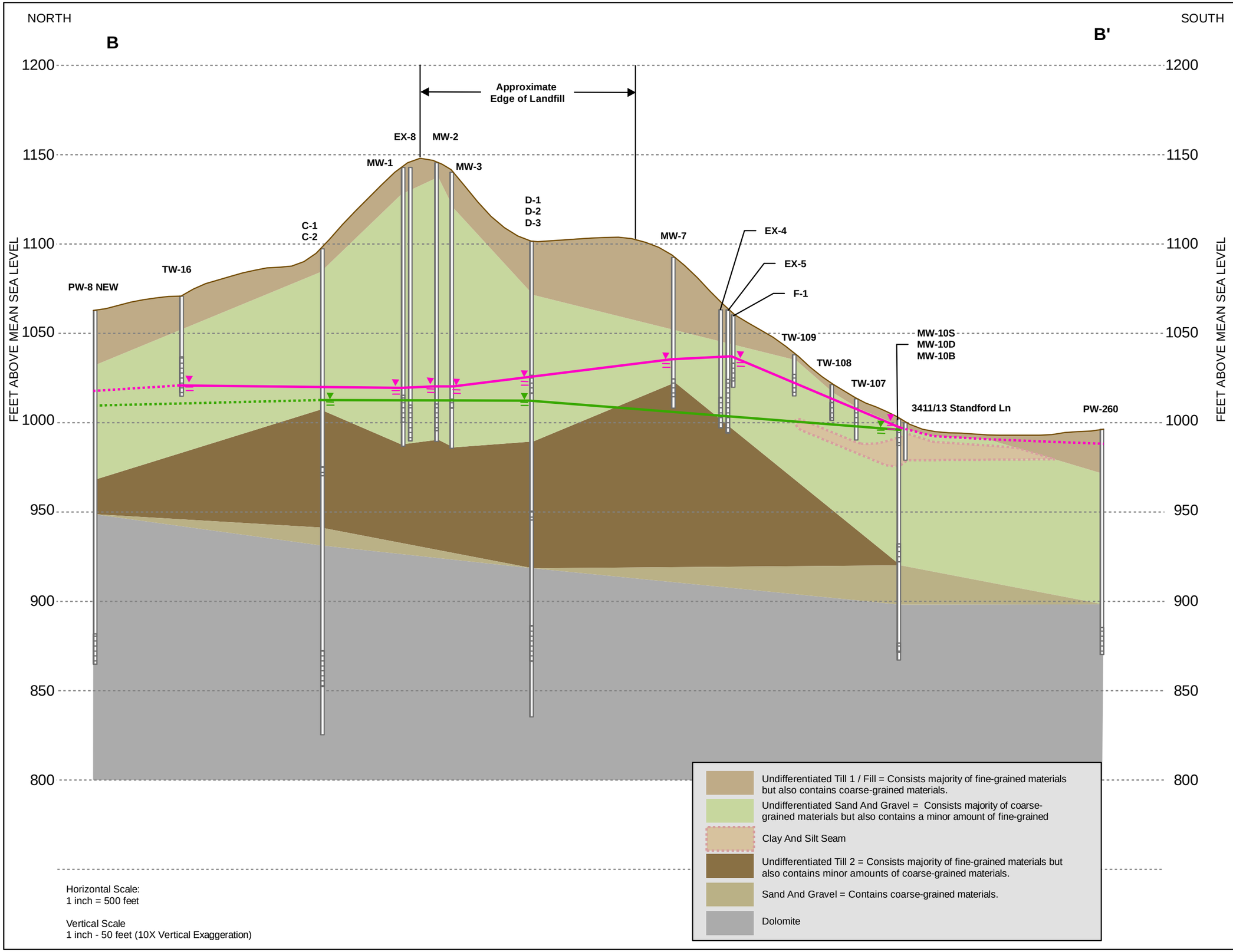
Schuster Drive Landfill
3995 Schuster Drive
West Bend, WI

Date: 3/5/2020
Project Number: 60485031

Legend

- Shallow Piezometric Surface (June 2019)
- Inferred Shallow Piezometric Surface (June 2019)
- Deep Piezometric Surface (June 2019)
- Inferred Deep Piezometric Surface (June 2019)
- Boring with well screen

Note:
Groundwater levels were measured between June 5 to July 1, 2019.



Horizontal Scale:
1 inch = 500 feet

Vertical Scale
1 inch - 50 feet (10X Vertical Exaggeration)

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FIGURE 2
CROSS SECTION B-B'

Schuster Drive Landfill
3995 Schuster Drive
West Bend, WI

Date: 10/26/2020
Project Number: 60485031

Legend

- Shallow Piezometric Surface (June 2019)
- Inferred Shallow Piezometric Surface (June 2019)
- Deep Piezometric Surface (June 2019)
- Inferred Deep Piezometric Surface (June 2019)

Note:
Groundwater levels were measured between June 4 to 6, 2019.
Extraction wells (EX-4, EX-5, and EX-8) and 3411 and 3413 Stanford Lane locations were extrapolated onto the cross section.